UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,105	10/31/2003	Yasunaga Miyazawa	117383	1446

25944 7590 08/08/2007

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER	
LEE, GINA W	
ART UNIT	**PAPER NUMBER**
2609	
MAIL DATE	**DELIVERY MODE**
08/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/697,105	MIYAZAWA, YASUNAGA	
	Examiner	Art Unit	
	Gina W. Lee	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5-8 and 11-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-8 and 11-16* is/are rejected.

7)☒ Claim(s) *1 and 6* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on July 13, 2007 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent 7, 065,487 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Objections

2. Claims 1 and 6 are objected to because of the following informalities: while the preambles of the claims refer to a "vehicle having noise," the bodies of the claims refer to a "space having noise". The examiner suggests that the wording in the claims be amended to avoid confusion (for example, changing "space" to "space inside a vehicle" or similar). Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-13 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deng et al. (US 6,876,966).

5. With respect to independent **claim 1** and **claims 15-16**, Deng teaches an acoustic model creating method for performing speech recognition within a vehicle having noise (column 6, line 37, noisy environment may be a car; column 10, line 62, noisy environment may be an airplane), the method comprising:

collecting various types of noise collectable within the space having noise (column 6, lines 40-44 noise is recorded from selected noisy environments);

creating plural types of noise data by classifying plural types of collectible noise (column 11, lines 2-13, each set of noise training data is associated with a different type of noise);

creating plural types of noise-superposed speech data by superposing the plural types of noise data on standard speech data (figure 8, column 6, lines 32-44, noise is added to the "clean" speech signals);

creating plural types of noise-removed speech data by performing a noise removal process on the plural types of noise-superposed speech data (figure 3, column 6, lines 45-47, noise reduction module applies one or more noise reduction techniques to the noise training data (302));

and creating plural types of acoustic models using the plural types of noise- removed speech data (column 6, lines 53-64, acoustic model is trained with "pseudoclean" training data (304); column 12, lines 36-48, different sets of data are used to train multiple acoustic models) but is silent as to the precise sources of the noise. However, Deng states that the raw training data includes anticipated additive noise from a noisy environment such as a car (column 6, lines 32-44).

The examiner posits there are many sources of noise, both internal and external to a vehicle, which would be well known to a user of a speech recognition system intended for use in a car. Thus anticipated noise would include noise due to weather conditions (such as the sound of rain or thunder), noise due to the traveling state of the vehicle (such as engine noise, noise of tires against the road, noise of wind due to an open window, or noise of passing cars and trucks),

noise due to the traveling location of the vehicle (such as construction noise, urban traffic noise, or airport noise), and noise due to operational states of apparatuses mounted in the vehicle (such as the sound of windshield wipers or of the fan, which may vary according to speed). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that Deng's method and apparatus, modified for use in a vehicle, would need to compensate for these noise types.

6. With respect to **claims 2 and 8**, Deng teaches that the noise removal process performed on the plural types of noise-superposed speech data is carried out using a noise removal method suitable for each of the noise data (column 11, lines 2-6, the noise reduction techniques applied to the training data can be the same for each type of noisy environment or may be tailored for the specific noise environment).

7. With respect to **claims 5 and 11**, Deng teaches:

collecting noise comprising a recording step of recording individual noise parameters corresponding to the plural types of noise to be collected (column 6, lines 39-44, noise is recorded; column 10, line 57, multiple sets of training data are used; column 11, lines 9-11, each set of training data is associated with a different type of noise),

and the plural types of noise to be collected being classified using each noise parameter corresponding to the plural types of noise to be collected, thereby creating the plural types of noise data (column 11, lines 9-11, each set of training data is associated with a different type of noise).

8. With respect to independent **claims 6 and 13**, Deng teaches a speech recognition apparatus for performing speech recognition within a space or vehicle having noise (column 6, line 37, noisy environment may be a car; column 10, line 62, noisy environment may be an airplane), the apparatus comprising:

a sound input device that inputs speech to be recognized and other noise (figure 4, column 7, lines 17-19, microphone (404) inputs speech signal and additive noise);

plural types of acoustic models created by the acoustic model creating method of claim 1 (figure 4, acoustic model (418); column 12, lines 36-48, multiple acoustic models may be used. The method of model creation has been addressed in the discussion of claim 1 above.);

a noise data determination device that determines which noise data of the plural types of noise data corresponds to the noise inputted from the sound input device (figure 13, column 12, lines 6-16, noise comparator (1302) compares the noise in the signal to training noise stored in memory);

a noise removal processing device that performs noise removal on the noise- superposed speech data on which the noise inputted from the sound input device are superposed based on the result of the determination of the noise data determination device (figure 13, column 12, lines 17-35, noise reduction module (1306, 1308, or 1310) applies noise reduction technique);

and a speech recognition device that performs speech recognition on the noise- removed speech data (figure 4, column 7, lines 57-60 and column 8, lines 47-63, decoder (412) identifies the most likely sequence of words).

9. With respect to **claim 7**, Deng teaches a noise parameter acquisition device that acquires noise parameters corresponding to the noise inputted from the sound input device (figure 13, column 12, lines 7-9, noise comparator (1302) uses the spectral content of the noise in identification of the noise).

10. With respect to **claim 12**, Deng teaches the same noise removal process being used at the time of creating the plural types of acoustic models and at the time of performing speech recognition (figure 3, column 6, line 66 to column 7, line 3, the same noise reduction techniques that were applied to the noisy training data are then applied to the test data (308); figure 13, column 12, lines 17-28, for multiple types of noise, noise is identified and the same noise reduction techniques that were applied to the training data are applied to the test data).

11. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deng et al. (US 6,876,966) in view of Kishi et al. (US 4,501,012).

12. With respect to **claim 14**, Kishi discloses a speech recognition system for an automotive vehicle but does not specifically teach the speech recognition apparatus of claim 6 of this application. Instead, Kishi makes mention of a "typical speech recognizer."

Deng teaches the speech recognition apparatus of claim 6, as addressed above in the discussion of claim 6. Deng does not explicitly teach the placement of the speech recognition apparatus in a vehicle, but does identify a car and an airplane as possible noisy environments where the apparatus may be used (column 10, lines 61-62).

As Kishi does not limit the type of speech recognition apparatus that may be used in the vehicle, and as Deng teaches vehicles as environments where a speech recognition apparatus may be used, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Kishi's vehicular speech recognition system with the speech recognition apparatus of Deng. Deng's speech recognition apparatus uses the method of training speech models by inserting noise followed by noise reduction and would afford more precision and accuracy than a generic speech recognition device because these models more closely match the testing data than other systems (column 1, lines 35-64).

Response to Arguments

13. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection presented above.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gina W. Lee whose telephone number is (571) 270-3139. The examiner can normally be reached on Monday to Thursday, 6:30 AM - 5:00 PM EST.

15. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Eisen can be reached on (571) 272-2687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

16. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Alexander Eisen
SPE
Art Unit 2609

GWL